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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,145	05/25/2001	Richard Alan Haase		4449

7590

09/25/2003

Mr Richard Haase
4402 Ring Rose Drive
Missouri City, TX 77459

EXAMINER

BARRY, CHESTER T

ART UNIT

PAPER NUMBER

1724

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/866,145

Applicant(s)

^A
HÄSE, RICHARD ALAN

Examiner

Chester T. Barry

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/14/02, 8/16/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 21-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 21-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Examiner in Charge of this Application

This application has been transferred to Examiner Chester T. Barry (Art Unit 1724, direct phone 703-306-5921).

Original Patent

The original patent, or a statement as to loss or inaccessibility of the original patent, must be received before this reissue application can be allowed. See 37 CFR 1.178.

Objections Relating to the Manner by Which Claims Have Been Amended

Claims 1, 4, 7, 8, 10, 11, 14, 15, 25 are objected to under 37 CFR 1.173(d). It is only those changes to the text of claims ***“relative to the patent being reissued”*** which must be shown by markings. Insofar as the misspelling “polyacrylamidee” [sic] did not appear in the patent’s claims, but rather was introduced in this reissue application itself (paper no. 1 filed 5/25/01), the attempted correction of the various instances of that typographical error in the amendment filed August 14, 2002, should NOT be marked at all. That is, it should not be marked -- [polyacrylamidee] polyacrylamides – as was done in the August 14, 2002, paper. Instead, a complete copy of each such claim bearing the “polyacrylamidee” [sic] typo should be presented in response to his objection even if no changes vis-à-vis the issued claim are to be made. For example, to overcome this

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objection to claim 1, claim 1 should be presented as:

1. A method for dewatering biological sludge that has been digested by a thermophilic digestion process comprising:

a. adding a polymeric quaternary ammonium compounds, aluminum sulfate, ferric chloride and blends thereof, as primary component, to the biological sludge; and

b. adding polyacrylamide to the biological sludge; such that any combinations of the primary component and of the polyacrylamides enhance dewatering of the sludge.

The "a" at line 3 is underlined because that word does not appear in the issued patent. Even though "polyacrylamidee" appears in the claims presented in the paper filed May 25, 2001, it should not appear in any form – bracketed or otherwise – because that misspelling does not appear in the issued patent claim. In reissue practice, claim markings are made only to show textual changes relative to the claims as they appeared in the issued patent. If you have any further questions about this, please telephone the examiner for clarification. The examiner leaves it to the applicant to ensure that claims 1, 4, 7, 8, 10, 11, 14, 15, 25 are presented with proper markings in the next response.

Furthermore, claims 16 – 18, 21, 24 27, 35 – 36 (as presented on August 14, 2002) are objected to under 37 CFR 1.173(d)(2) for want of these **new** claims (relative to the issued patent) to be shown entirely underlined.

Similarly, claims 37 – 38 (as presented on May 25, 2001) are objected under 37 CFR 1.173(d)(2) for want of the **entirety** of claim 37 to be underlined and for **none** of claim 38 to be underlined. See the unnumbered page immediately following page 28 of the preliminary amendment filed May 25, 2001: None of the portions of new claims 37 and 38 appearing on this page were underlined.

Claim 10 is separately objected to for want of the claim to appear marked as follows: "... is then added for [final] fmal floc formation." To the extent that incursion of "fmal" was inadvertent, claim 10 should be re-presented – if claim 10 as issued is the claim for which applicant seeks further examination – as claim 10 as issued without any markings (underlinings or bracketing).

Claim 11 is separately objected to for want of the claim to appear marked as follows: "... with the anionic polyacrylamideee having a higher" To the extent that incursion of the extra "e" in "polyacrylamidee" was inadvertent, claim 11 should be re-presented – if claim 11 as issued is the claim for which applicant seeks further examination – as claim 11 as issued without any markings (underlinings or bracketing).

Observation

It is noted that applicant Haase stated in both this application, filed on April 6, 1998, and in application serial number 08/721557, filed on Sept. 26, 1996, that,

[o]nly within the last three years have polyacrylamides containing cationic monomers, based on allyl chlorides, been available.

35 USC §103 – Nielsen / Sorensen

Claims 1, 2, 4, 5, 6, 7, 8, 9, 14, 15, 16, 21, 25, 26, 23, 33, 17, 22, 28, 18 are rejected under 35 USC Sec.103(a) as being obvious over Nielsen, Sorensen, and Pohoreski, as interpreted in the light of Haldeman and either Schwab or Wiker.

Claim 1 is directed to a method for dewatering biological sludge that has been digested by a thermophilic digestion process. Paraphrasing claim 1, the method

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comprises:

Digesting a biological sludge by a thermophilic digestion process;

Adding polymeric quaternary ammonium "compounds" [sic], aluminum sulfate, ferric chloride "and blends thereof," as primary component, to the digested biological sludge; and

Adding polyacrylamide to the digested biological sludge, *such that* any combinations of the primary component and of the "polyacrylamides" [sic] enhance dewatering of the sludge.

USP 5954964 to Nielsen describes digesting a biological sludge by a thermophilic digestion process ("digester 30," col 1 lines 57-65; col 2 line 55). Nielsen also describes adding a lower molecular weight polymer as a primary component, i.e., as a coagulant. Specifically, Nielsen states:

- "Various types of low molecular weight polymers . . . can be used in the process of the present invention"
- "[T]he low . . . molecular weight polymers are usually polyacrylamide polymers," and
- "[S]uitable low molecular weight polymers are Percol 402, Percol 406, Alkafix

357." As shown by either USP 5069831 to Schwab (col 4 line 11-12) or USP 5126013 to Wiker (col 5 lines 4-6), Percol 406 is polyDADMAC, a polymeric quaternary ammonium compound. Accordingly, Nielsen describes adding polyDADMAC as a primary component (i.e., coagulant) to the digested sludge. Nielsen also describes addition of a higher molecular weight polymeric flocculent, e.g., Percol 757, to the digested sludge to improve sludge dewatering (col 6 line 41 – line 67). As shown by

USP 4396513 to Haldeman (col 5 lines 7, 45-47), Percol 757 is a polyacrylamide type polymer. Nielsen then dewateres the polymer-treated sludge. Per claim 17, see Nielsen col 6 line 51 ("simultaneously"). Per claims 4 and 18, Nielsen describes addition of a cationic polyacrylamide (col 7 line 32).

Nielsen does not appear to anticipate claim 1 because Nielsen does not describe addition of "aluminum sulfate, ferric chloride and blends thereof, as primary component" along with the Percol 406 (polyDADMAC) polymeric quaternary ammonium compound to the digested biological sludge.

Like Nielsen, WO 95/33697 to Sorensen is directed to the problem of dewatering sewage sludge (page 1 lines 4-5). Sorensen teaches that it was known to treat the sewage sludge suspension with an inorganic coagulant, such as aluminum sulfate (page 12 line 16) or ferric chloride (page 12 line 16+), and a polymeric flocculant (page 1 lines 8-17). Alternatively, Sorensen teaches using a polymeric coagulant and a polymeric flocculant.

In view of Sorensen's teaching of the functional equivalence of using an inorganic coagulant and polymeric flocculant on the one hand, or a polymeric coagulant and a polymeric flocculant on the other hand, it would have been obvious to have substituted an inorganic coagulant, e.g., aluminum sulfate or ferric chloride, for Nielsen's Percol 406, thereby resulting in the use of an inorganic coagulant and a high molecular weight polymeric flocculant. Furthermore, since Nielsen or Sorensen show the suitability of any of the following coagulants (listed below at left)(next page) and a higher weight polymeric flocculant (shown below at right)(next page), it would have been obvious to have used any combination of the coagulant compounds together with

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the higher weight polymeric flocculant. Simultaneous use of a combination of more than one type of coagulant (in addition to the polymeric flocculant) is clearly suggested by Sorensen's description of using both ferric chloride and polyDADMAC in Example 8 ("ferric chloride" – "polyDADMAC"). Moreover, USP 4882069 to Pohoreski expressly teaches that a combination of aluminum sulfate, "iron chloride," and polyelectrolytes can be used in "combination" to dewater sludge (col 1 line 38).

<u>Coagulant</u>	<u>Flocculant</u>
polyDADMAC (Percol 406) (Nielsen)	higher weight polymeric flocculant
ferric chloride and polyDADMAC (Sorensen Example 8)	
Aluminum chloride (Sorensen)	
Ferric chloride (Sorensen)	

Accordingly, it would have been obvious to have used a combination of ferric chloride, polyDADMAC, aluminum sulfate, and "blends thereof" as a coagulant "cocktail" in combination with a higher weight polymeric flocculant for the purpose of dewatering a thermophilic-digested biological sludge, as suggested by Nielsen, Sorensen and Pohoreski.

Per claims 5 - 9, it would have been obvious to have used any proportion of the various coagulants in the "coagulant cocktail" insofar as the art suggests the functional equivalence and use in combination of the various coagulants, including ferric chloride, aluminum sulfate, polyDADMAC, and low molecular weight polyacrylamide.

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Claims 16, 18

Claims 16, 37, 38, 23 and 18, 29 are rejected under 35 USC §103(a) as obvious over Sorensen and Gould.

Claims 16 and 18 are directed to a method for dewatering biological sludge that has been digested by a thermophilic digestion process. Paraphrasing claim 16, the method comprises:

Digesting a biological sludge by a thermophilic digestion process;

Adding a polymeric quaternary ammonium compound and at least one of aluminum sulfate and ferric chloride to the digested biological sludge; and

Adding polyacrylamide to the digested biological sludge, *such that* the combination of the polymeric quaternary ammonium compound, aluminum sulfate and/or ferric chloride, and the polyacrylamide enhances dewatering of the sludge.

Claim 18 does not require addition of a polymeric quaternary ammonium compound or aluminum sulfate, but does require addition of ferric chloride.

Sorensen (at Example 8, page 21 – 22) describes:

Digesting a biological sludge by a digestion process ("biological solids" page 21 line 29);

Adding a polymeric quaternary ammonium compound ("polyDADMAC" at page 22 line 1) to the sludge;

Adding at least one of aluminum sulfate and ferric chloride ("ferric chloride" page 21 line 30) to the digested biological sludge; and

Adding polyacrylamide ("a high molecular weight polymer" page 21 line 31, "a flocculent copolymer comprising acrylamide" page 22 lines 8 – 10) to the digested

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biological sludge, *such that* the combination of the polymeric quaternary ammonium compound, aluminum sulfate and/or ferric chloride, and the polyacrylamide enhances dewatering of the sludge.

Sorensen does not state whether the digestion process was a "thermophilic digestion process." It would have been obvious to have digested the biological sludge by a thermophilic digestion process prior to addition of the dewatering conditioners (coagulant and flocculant) for the various reasons given by USP 4246099 to Gould, for example, explaining why thermophilic digestion is advantageous over mesophilic digestion. Among these reasons are more rapid sludge stabilization (col 5 line 23).

With respect to claim 29, the relative proportion of various components in a mixture or composition is generally known to be a result-effective variable, so optimization of the same would have been obvious in this case.

Citations of Interest

USP 5137599 to Maxham is cited of interest and provides background on biological solids of paper mill effluent (column 1).

Claim 4 of USP 6083404 to Sommese is cited of potential interest to applicant.

Epi-DMA

Claims 3 and 24 are rejected under 35 USC § 103(a) as obvious over Nielsen, Sorensen, and Pohoreski (interpreted in light of Haldeman and either Schwab or Wiker), as applied above to claims 1 and 17, respectively, further in view of applicant's admission or USP 5965027 to Allen.

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The prior art of record in this application appears to appreciate the interchangeability or functional equivalence of epi-DMA for DADMAC with respect to the micro floc formation function. See, for example, applicant's admission that "[p]olymeric quaternary ammonium compounds . . . have been used for water clarification" listing DADMAC and epi-DMA as exemplary polyquat materials. Accordingly, it would have been obvious to have substituted epi-DMA for polyDADMAC in Nielsen's process. See also, for example, USP 5965027 to Allen.

"Primary Sludge"

Claims 13, 34, 35, and 36 are rejected under 35 USC § 103(a) as obvious over Nielsen, Sorensen, and Pohoreski (interpreted in light of Haldeman and either Schwab or Wiker), as applied above to claims 1, 16, 17, and 18, respectively, further in view of one or more of USP 4380496, USP 3613564, and USP 3397139.

As shown by at least one of USP 4380496, USP 3613564, and USP 3397139, it is conventional to mixed secondary biological solids with primary sludge for achieving the desired solids concentration prior to dewatering. It would have been obvious, therefore, to have mixed the digested biological solids of the primary reference with primary sludge solids before conditioning and before dewatering to achieve the desired solids concentration, as suggested by one or more of USP 4380496, USP 3613564, and USP 3397139.

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112, 2nd paragraph – “a ferric chloride”

Claim 21, 25, 31, 37, 38 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. It is unclear what “a” ferric chloride is. There appears to be but one “ferric chloride.” If applicant has disclosed more than one specie of “ferric chloride,” he is requested to point to column and line of the issued patent where such disclosure can be found.

112, 2nd paragraph – “ratios”

Claims 28 and 29 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. The claim recites “ratios” of polyacrylamide to aluminum sulfate. At any given moment, there appears to be but one ratio of polyacrylamide to aluminum sulfate. Accordingly, applicant’s reference to “ratios” is unreasonably confusing. The same rationale applies to claim 29.

112, 2nd paragraph – “thermophilic”

Claims 1 – 18, 21 - 38 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought.

Each of claims 1, 16, 17, and 18 recites “thermophilic digestion process.” If by “thermophilic digestion process,” applicant means a digestion process populated by “thermophiles” bacteria, then the claim is not reasonably precise in scope because USP

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5650070 to Pollock (at col 3 lines 7-12) teaches that "there is no clear operating boundary between mesophiles and thermophiles, since some of each species exist at both mesophilic and thermophilic temperatures." If, on the other hand, applicant intends "thermophilic digestion process" to denote a digestion process operated within a particular temperature range regardless of the mesophile/thermophile makeup of the dominant bacterial population, then the term thermophilic is no less unclear for there does not appear to be any art-recognized agreement as to the numeric bounds of the thermophilic temperature ranges.

In particular, it is unclear whether digestion processes operated at between 105°F and 115°F would meet the "thermophilic digestion process" limitation of claims 1 – 18, 21 – 38. Applicant clearly indicates he regards 105°F (40°C) as a mesophilic temperature (col 2 line 15) and equally clearly that he regards 131°F (55°C) as a thermophilic temperature (col 2 line 33). Applicant refers to the active bacteria at 115°F as being of the "thermophilic variety," but it is unclear whether a digestion process operated at 115°F would meet applicant's understanding of a "thermophilic digestion process" because he states that a "thermophilic system *relies on* " (emphasis added) temperatures of 131°F (55°C) or higher. In short, it is not reasonably clear on this record if digestion processes operated at temperatures between 40°C and 55°C would meet the recited limitation of a "thermophilic digestion process."

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112, 2nd paragraph – “at least one of . . . or”

Claims 16, 21, 25, 26, 30, 31, 37, 38, 23, 26, 27, 30, 32-34 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought.

Claim 16 recites in pertinent part “adding . . . at least one of aluminum sulfate or [sic] ferric chloride to the biological sludge.” Proper grammar requires:

a) “adding . . . at least one of aluminum sulfate ~~or~~ and ferric chloride to the biological sludge;”

b) “adding . . . ~~at least one of~~ aluminum sulfate, ~~or~~ ferric chloride, or both aluminum sulfate and ferric chloride to the biological sludge;” or

c) an expression equivalent in meaning to (a) or to (b).

Claim 16 also refers to “the combination of . . . aluminum sulfate, ferric chloride, and polyacrylamide” thereby rendering the scope of the claim unreasonably imprecise such that the public would not be afforded fair notice of the sought-for patent protection.

Claim 26 implicitly requires that aluminum sulfate be added while Claim 27 implicitly requires that ferric chloride be added.

112, 2nd paragraph – “the anionic polyacrylamide”

Claims 16, 32 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. Claim 16 fails to provide antecedent basis for claim 32’s recitation of “the anionic polyacrylamide.” Similarly, it is unclear whether claim 32’s recitation of an

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“anionic polyacrylamide” implicitly limits the scope of claim 16’s “polyacrylamide” to an *anionic* polyacrylamide.

112, 2nd paragraph – “enhance the dewatering”

Claims 1 – 18, 21 - 38 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought.

Claims 1, 16, 17, and 18 refer to enhancing the dewatering of the sludge. It is unclear whether the dewatering enhancement provided by the addition of polyacrylamide and any one of the various “primary component” materials, i.e., the combination of polymeric quaternary ammonium compounds, aluminum sulfate, ferric chloride, and blends thereof (claim 1), polymeric quaternary ammonium compound and at least one of aluminum sulfate and ferric chloride (claim 16), aluminum sulfate (claim 17), or ferric chloride (claim 18), is measured relative to that degree of dewatering accomplished using just the primary component without polyacrylamide, just the polyacrylamide without the primary component, or relative to the dewatering accomplished without the use of any sludge conditioner, i.e., without any primary component or polyacrylamide.

112, 2nd paragraph – “DADMAC family”

Claims 2, 23, 3, 24 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. In claim 2, it is unclear what a “(DADMAC) family” is because DADMAC is a

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unique compound. It is not a genus to which more than one specie belongs.

Furthermore, it is unclear what could be meant by "the . . . compounds [sic] are from [the] . . . (DADMAC) family" because that "family" includes but one lonesome member, i.e., DADMAC. So it is unclear how a plural number of compounds (plural) could be selected from a genus having but one specie member.

Similarly, in claim 3, it is unclear what an "(epi-DMA) family" is because epi-DMA is a unique compound. It is not a genus to which more than one specie belongs.

Furthermore, it is unclear what could be meant by "the . . . compounds [sic] are from [the] . . . (epi-DMA) family" because that so-called "family" includes but one lonesome member, i.e., epi-DMA. So it is unclear how a plural number of compounds (plural) could be selected from a genus having but one specie member.

112, 2nd paragraph – "and blends thereof"

Claims 1 – 18, 21 – 38 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. Claim 14 recites a composition comprising (a) polymeric quaternary ammonium compounds, (b) aluminum sulfate, (c) ferric chloride, and (d) "blends thereof." It is unclear whether the "blends" is a blend of (a) and (b), (a) and (c), (b) and (c), or a blend of (a), (b), and (c). Separately, it is not at all clear whether a composition comprising polymeric quaternary ammonium compounds, aluminum sulfate, ferric chloride, and polyacrylamide meeting the other limitations of the claim not at issue here, would meet all the limitations of the claim for want of the presence of "blends thereof." In short, it is unclear how a mixture comprising elements X, Y, and Z

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does not – without having said anything more – inherently include a “blend” of X, Y, and Z. The specific recital of “and blends thereof” obfuscates what otherwise appears to be a reasonably clearly defined listing of compositional members. The same rationale applies to claims 1 – 13 and 15 – 18, 21 – 38 in which the phrase “and blends thereof” is also recited.

112, 2nd paragraph – Claim 37

Claim 37 is rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. Claim 37 cannot be understood. Claim 37 reads:

37. A composition for dewatering biological sludge according to claim 21 comprising a polymeric quaternary ammonium compound, aluminum sulfate, ferric chloride and blends thereof, as primary component, and a polyacrylamide, said components being present in the composition in dewatering biological sludge from a thermophilic digestion process.

It would appear, judging from a comparison of claim 37 as presented with issued claim 14, that the expression “a ratio to enable the composition to function as an agent for” was inadvertently omitted from the point at which applicant ceased underlining the text of new claim 37, i.e., between “in” and “dewatering.” Insofar as the foregoing attribution is merely speculative on the part of the examiner, claim 37 has not been examined vis-à-vis the prior art.

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Minor Observations

In claims 17 and 18, it is suggested that "the combination . . . enhance the dewatering" be changed to "the combination . . . enhanceses the dewatering" such that the noun and verb agree in number.

In at least claim 1, "a . . . compounds" should read either "a compound" or simply "compounds."

In claim 21, it is suggested that "both . . . is" be corrected to "both . . . are."

Obviousness Type Double Patenting.

Claims 1 – 4, 9, 10, 14, 15, 16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 – 4, 7, 8, 13, 14, 15, respectively, of U.S. Patent No. 5846435 to Haase in view of Sorensen and Pohoreski.

Claim 1 of USP 5846435 to Haase is shown below at left. Claim 1 of the pending reissue application is shown below at right, with underlinings showing limitations (or text) not found in the patent '435 claim. Text of the '435 patent claim not appearing in

the pending claim is indicated by strikethrough.

Claim 1 of USP 5846435 to Haase	Pending Claim 1
<p>1. A method for dewatering biological sludge that has been digested by a thermophilic digestion process comprising:</p> <p>a. adding polymeric quaternary ammonium compounds, as primary component, to the biological sludge; and</p> <p>b. adding polyacrylamide to the biological sludge;</p> <p>such that any combinations of the polymeric quaternary ammonium compounds and of the polyacrylamides enhance dewatering of the sludge.</p>	<p>1. A method for dewatering biological sludge that has been digested by a thermophilic digestion process comprising:</p> <p>a. adding <u>a</u> polymeric quaternary ammonium compounds [<i>sic</i>], <u>aluminum sulfate, ferric chloride and blends thereof</u>, as primary component, to the biological sludge; and</p> <p>b. adding polyacrylamide to the biological sludge;</p> <p>such that any combinations of the <u>primary component</u> polymeric quaternary ammonium compounds and of the polyacrylamides enhance dewatering of the sludge.</p>

A comparison of the left and right sides of the table above reveals the difference between the scope of the pending claim and the scope of the issued claim. Apart from the addition of polymeric quaternary ammonium "compounds" (note plurality) that is limiting of both the patented and pending claims, the pending claim is further limited by the step of adding aluminum sulfate, ferric chloride, and blends of aluminum sulfate and ferric chloride. In the patented claim, the "primary component" limitation is met by polymeric quaternary ammonium compounds, whereas in the pending claim, the primary component must include polymeric quaternary ammonium compounds, aluminum sulfate, ferric chloride, and blends of aluminum sulfate and ferric chloride.

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In view of Sorensen and Pohoreski's suggestion to use a combination of inorganic coagulants, e.g., ferric chloride and aluminum sulfate, and low molecular weight polymeric coagulants, e.g., polyDADMAC, as a primary component before addition of a higher molecular weight polymeric flocculant, it would have been obvious to have substituted a combination of polymeric quaternary ammonium compounds, aluminum sulfate, ferric chloride, and blends of aluminum sulfate and ferric chloride for the polymeric quaternary ammonium compounds recited in Haase's '435 patent claim 1.

Subject Matter Allowable over the Prior Art

Claims 10, 11, 12, and 31 would be allowable if amended to include the limitations of the claims from which they depend, and amended to overcome any non-prior art based objections and rejections set forth above. With respect to claims 10 and 31, the prior art does not appear to describe or suggest forming a "cationic overcharge" through the addition of polymeric quaternary ammonium compounds (sic, "compounds" (plural), see claim 1), aluminum sulfate, ferric chloride, "and blends thereof," the foregoing materials added directly to the sludge, with subsequent addition of an anionic polyacrylamide.

Assignee

PTO assignment records do not show a recorded assignment of the patent at issue. If there is no assignee, applicant is requested to affirmatively state so on the record.

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New Matter - "Primary Sludge"

Claim 13 is rejected under 35 USC § 112, first paragraph, as claiming subject matter not supported by the original disclosure. Unlike claims 34 – 36, claim 13 refers to the biological sludge "compris[ing]" primary sludge. The application as filed supports "mixing" the biological sludge with the primary sludge, but there is no indication that the primary sludge is itself a biological sludge, or that an element or component of the biological sludge is "primary sludge." See col 5 line 2, col 8 lines 28-30, col 9 line 6.

New Matter - "simultaneously with step (a)"

Claims 17, 22, 24, 28, 35 are rejected under 35 USC § 112, first paragraph, as claiming subject matter not supported by the original disclosure. Claim 17 encompasses adding the polyacrylamide of step (b) at the same time that the aluminum sulfate of step (a) is added to the biological sludge. There is no support for this subject matter in the original disclosure. The claimed invention is directed to what the specification refers to as "method five." At col 8, applicant states in pertinent part:

Method five involves the addition of polymeric quaternary ammonium compounds, aluminum sulfate, ferric chloride and blends thereof, as primary component to the biological sludge. Polyacrylamide is **then** added to the biological sludge such that the primary component and the polyacrylamides combine to enhance dewatering of the sludge.

In a preferred embodiment [of the method five invention], the polymeric quaternary ammonium compound, aluminum sulfate, ferric chloride and blends thereof **are added directly to the sludge** and, **upon formation of microflocs** of the sludge from the polymeric quaternary ammonium compound, aluminum sulfate, ferric chloride and blends thereof, a cationic **polyacrylamide is added** to form a floc that dewateres the sludge.

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Method five also involves . . . formation of a cationic overcharge within a developed microfloc system, and an anionic polyacrylamide is **then added** for final floc formation.

(emphasis supplied). In method five, the subject matter to which claim 17 is directed, it is clear that the addition of polyacrylamide must follow (in time) the previous addition of the aluminum sulfate and other method five "primary component" constituents. Put another way, there is no indication in the original written description that applicant was in possession of the concept of adding the step (b) **flocculating** polyacrylamide at the same time that the micro floc-forming primary components were being added.

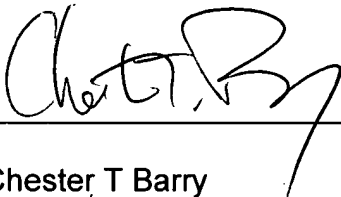
Anticipation

Claim 14 is rejected under 35 USC § 35 U.S.C. Sec. 102(b) as anticipated by USP 4711727 to Matthews. Matthews describes a composition comprising a cationic high molecular weight polyelectrolyte, such as polyacrylamide (col 13 line 23), a cationic low-molecular weight polyelectrolyte as the component (b) (col 13 line 27); e.g., DADMAC (Matthews claim 6), and alum (i.e., aluminum sulphate, per col 5 line 20) (claim 12). Matthews describes that alum, one of the "auxiliary agents selected from known flocculants" (col 5 line 16), can be added entirely into the Matthews composition, i.e., not necessarily added in part to the aqueous system being treated by the Matthews composition (col 5 lines 19-21). Matthews also makes clear that any of the "known flocculants" (col 5 line 17), e.g., sodium aluminate, ferric sulphate, ferrous sulphate, aluminium chlorohydrate, polyelectrolytes, or aluminium sulphate (papermakers' alum), can be added into the composition. It is clear from Matthews col

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1 line 35 that Matthews appreciated that "ferric chloride" was one such known flocculant. If there were any doubt that Matthews was indeed in possession of a composition comprising the combination of DADMAC, alum, polyacrylamide, and ferric chloride, USP 4867789 to Eida or USP 4781839 to Kelly make clear that the skilled artisan would have understood Matthews to have been in possession of the claimed invention (comprising in part "ferric chloride") because Eida and Kelly teach that "ferric chloride" was a well-known coagulant/flocculant. The recitation in claim 14 "for use in the method of claim 1," is merely a statement of intended use of the claim composition, and does not itself limit the scope of the claimed composition.

Respectfully,



Chester T Barry
Examiner
703-306-5921

9/5/03